SEQUENCE LISTING

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<120> THE GENE CLUSTER INVOLVED IN SAFRACIN BIOSYNTHESIS AND ITS USES FOR GENETIC ENGINEERING

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aggttatgac gtggtgacct tgaccgactg caccgcgaca ttcagtgatg aacaacagcg 25560
cgcagccgag cagtttacgt tgccgatgtt tttcgcaaac cctgcaacac accgcgtttc 25620
tgcaagcact gaacgccgga taaaaaagc ggcggactcc tgccgagtcg ccgctttttc 25680
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ccgggtaaac cagctcatcc ttggcatggc ggttgatgat ctggaatttg tcgtgctcag 25980
gcacgttggc ccacactggt catcgcggcg tacacgacat caccgatggc cgtcgcgtgt 26040
tcagtggaag tgtcggcggc gaggtcgatt cgaactaaag gcatggacaa atccttagtg 26100
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gacaagttgt aggaaaatga caagccggaa aaccgcacta ccggtggaaa ggcacgcacc 26460
atcacagcag gggctgcgcc tatcgcgccg acaaaaaaac cggtaagtga atagagtgga 26520
accagccatt gcgggtgcgt ttcaagcgtc ttgaacaaga gcagtgcgct gaacagaagc 26580
atgacgctgc cgatcatcaa tacccarccc gcactgaaat gatcggccag tttcccggcg 26640
atcacgcaac caacactcaa rrcacrcaat agcgagactg ttggcctgca aggcttgcgc 26700
tgcag                                                             26705


<210> 2
<211> 1004
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 2
Met Leu Leu Glu Val Ala Phe His Val Ile Thr His Leu Ser Thr Ser
  1               5                  10                  15

Gln Leu Val Ser Arg Ile Glu Arg Val Val Glu Arg His Ala Ser Leu
             20                  25                  30

Arg Gln Arg Phe Val Met Arg Asn Gly Thr Tyr Trp Ile Glu Gln Ala
         35                  40                  45

Pro Pro Gln Gln Arg Arg Tyr Cys Val Val Arg Thr Tyr Asp Glu Ala
```

```
     50                  55                  60

Ser Thr Asp Ala Leu Leu Ala Pro Ser Arg Glu His Ile Gly Val Glu
 65                  70                  75                  80

Ser Glu Arg Leu Phe Arg Ala Glu Val Val Glu Arg Ser Asp Gly Gln
                 85                  90                  95

Arg Tyr Leu Val Phe Arg Ile His His Ile Ile Ala Asp Leu Trp Ser
            100                 105                 110

Val Gly Leu Leu Ile Arg Asp Phe Ala Glu Asp Cys Met Asp Arg Ser
        115                 120                 125

Ser Ile Thr Leu Ala Ser Arg Pro Ile Ala Pro Leu Ile Asp Pro Glu
    130                 135                 140

Phe Trp Arg His Gln Met Ser Gln Asp Thr Pro Phe Ser Leu Pro Met
145                 150                 155                 160

Ala Ser Leu Glu Gln His Thr Asp Arg Arg Met Val Leu Ser Ser Phe
                165                 170                 175

Val Ile Asp Gln Glu Ser Ser Ala Asp Leu Ala Arg Leu Ala Thr Ala
            180                 185                 190

Cys Ala Val Thr Pro Tyr Thr Val Met Leu Ala Ala Gln Val Leu Ala
        195                 200                 205

Leu Ser Arg Ile Gly Gln Ser Gly Arg Leu Ser Leu Ala Val Thr Phe
    210                 215                 220

His Gly Arg Asn Arg Gly Asn Lys Asp Ala Val Gly Tyr Phe Ala Asn
225                 230                 235                 240

Thr Leu Ala Val Pro Phe Asp Val Ser Glu Cys Ser Val Gly Glu Phe
                245                 250                 255

Val Lys Arg Thr Ala Lys Arg Leu Asp Glu Ala Ser Lys Ala Ser Val
            260                 265                 270

Gly Ala Gly Tyr Pro Glu Leu Ala Glu Phe Met Thr Pro Leu Gly Trp
        275                 280                 285

Ala Ala Thr Ala Pro Thr Asn Ala Val Ile Tyr Gln Gln Asp Met Pro
    290                 295                 300

Gly Met Pro Arg Gly Leu Ala Ala Ala Leu Leu Gly Leu Gly Thr Val
305                 310                 315                 320

Gln Leu Gly Glu Met Ala Leu Thr Ala Glu Gln Ala Pro Pro Ser Ile
                325                 330                 335

Gly Pro Phe Ala Thr Ala Leu Leu Leu Thr Arg His Asp Gly Lys Leu
            340                 345                 350

His Gly Arg Val Glu Val Asp Pro Ala Gln His Pro Gly Trp Leu Ala
        355                 360                 365

Glu Ala Leu Ala Arg Gln Phe Ala Val Ile Leu Arg Glu Met Val Arg
    370                 375                 380

Asp Pro Gln Ala Arg Leu Ser Ala Leu Pro Ala Cys Leu Leu His Gln
```

385 390 395 400

Pro Lys Tyr Pro Ser Gln Ala Arg Pro Ala Pro Ala Ser Glu Thr Leu
405 410 415

Val Ala Thr Phe Leu Arg Gln Val Ala Ile Thr Pro Asp Lys Pro Ala
420 425 430

Leu Arg Thr Pro Gln Ala Ser Ile Ser Tyr Ser Glu Leu Ala Ser Arg
435 440 445

Val Ala Arg Leu Ser Ala Ala Leu Arg Val Arg Gly Phe Lys Pro Glu
450 455 460

Gln Thr Leu Ala Ile Leu Leu Pro Arg Asp Ile Asn Leu Val Pro Ala
465 470 475 480

Leu Leu Ala Ile Met Ala Cys Gly Gly Ser Tyr Val Pro Leu Ser Asp
485 490 495

Ala Asn Pro Ala Glu Leu Asn Arg Ser Ile Leu Thr Arg Ala Arg Cys
500 505 510

Arg Ala Ile Leu Thr Asp Gln Glu Gly Leu Thr Arg Phe Ala His Leu
515 520 525

Ala Pro Cys Trp Ser Leu Ser Asp Leu Leu Ser Met Pro Asp Ala Pro
530 535 540

Leu Gln Asp Gln Ser Lys Leu Gln Ala Lys Ala Tyr Ile Leu Phe Thr
545 550 555 560

Ser Gly Ser Thr Gly Glu Pro Lys Gly Val Ala Ile Thr His Ala Asn
565 570 575

Ala Ala Asn Leu Leu Arg Trp Ala Ala Leu Asp Cys Gly Pro Glu Tyr
580 585 590

Leu Ala Gln Thr Leu Ala Ala Thr Pro Thr Thr Phe Asp Leu Ser Ile
595 600 605

Phe Glu Met Phe Ala Pro Leu Met Val Gly Gly Cys Val Gln Pro Val
610 615 620

Ser Ser Val Met Ala Leu Ile Asp Asn Pro Ala Leu Leu Lys Gly Thr
625 630 635 640

Thr Leu Ile Asn Thr Val Pro Ser Val Ala Asp Ala Leu Leu Gln His
645 650 655

Asp Val Leu Val Pro Ser Leu Arg Met Leu Asn Leu Ala Gly Glu Pro
660 665 670

Leu Asn Arg Asp Leu Tyr Leu Arg Leu Gln Ala Lys Leu Thr Ala Thr
675 680 685

Arg Ile Val Asn Leu Tyr Gly Pro Thr Glu Thr Thr Thr Tyr Ser Thr
690 695 700

Ala Leu Val Ile Glu Pro Ala Gln Gln Glu Ile Thr Ile Gly Phe Pro
705 710 715 720

Leu Tyr Gly Thr Trp Val Asp Val Val Asp Gln Asn Met Gln Ser Val

725 730 735

Gly Ile Gly Val Pro Gly Glu Leu Ile Ile His Gly His Gly Val Ala
740 745 750

Gln Gly Tyr Val Ser Asp Pro Val Arg Ser Ala Ala Ser Phe Leu Pro
755 760 765

Ala Ser Asp Gly Leu Arg Cys Tyr Arg Thr Gly Asp Arg Val Arg Trp
770 775 780

Leu Pro Asp Gly Arg Leu Asp Phe Ile Gly Arg Glu Asp Asp Gln Val
785 790 795 800

Lys Val Arg Gly Phe Arg Val Glu Leu Gly Pro Val Gln Ala Ala Leu
805 810 815

His Ala Ile Glu Thr Ile His Glu Ser Ala Val Val Val Val Pro Lys
820 825 830

Gly Gln Gln Arg Ser Ile Val Ala Phe Ile Val Leu Lys Ala Pro Ser
835 840 845

Glu Asp Glu Ala Val Gln Arg Asn Asn Ile Lys Gln His Leu Leu Gly
850 855 860

Val Leu Pro Tyr Tyr Ala Leu Pro Asp Lys Phe Ile Phe Val Lys Ala
865 870 875 880

Leu Pro Arg Asn Thr His Gly Lys Ile Asp Arg Thr Leu Leu Leu Gln
885 890 895

His Glu Pro Gln Thr Glu Gln Glu Ser Ala Met Arg Asp Ala Thr Asp
900 905 910

Val Glu His Arg Ile Ala Asn Cys Trp Gln Thr Ile Ile Gly His Pro
915 920 925

Val Gln Leu His Glu Asn Phe Leu Asp Ile Gly Gly His Ser Leu Ser
930 935 940

Leu Thr His Leu Thr Gly Leu Leu Arg Lys Glu Phe Asn Ile His Ile
945 950 955 960

Ser Leu His Asp Leu Trp Ile Arg Pro Thr Ile Glu Gln Gln Ala Asp
965 970 975

Phe Ile His Lys Leu Gln Asn Ser Val Leu Thr Lys Pro Ala Ala Ala
980 985 990

Pro Ile Pro Arg Leu Asp Arg Lys Ile Ser His His
995 1000

<210> 3
<211> 1062
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 3
Met Ser Val Asp Thr Cys Arg Thr Ala Thr Phe Pro Ala Ser Tyr Gly
1 5 10 15

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Gln Glu Gln Ile Trp Phe Leu Asn Glu Leu Asn Pro His Ser Gln Leu
            20                  25                  30

Ala Tyr Thr Leu Ala Met Lys Val Ser Ile Ala Gly Lys Leu Asn Thr
        35                  40                  45

Leu Arg Leu Gln Arg Ala Val Asn Gln Val Val Ala Ser Gln Glu Ile
    50                  55                  60

Leu Arg Thr Ser Phe Ala Tyr Lys Asn Gln Lys Leu Ser Gln Val Ile
65                  70                  75                  80

Ser Pro Ser Ala Thr Leu Pro Ile Arg Ser Ala His Cys Ile Asp Asp
                85                  90                  95

Val Pro Gly Leu Gln Arg Leu Ile Asn Met Glu Ala Gln Arg Gly Trp
            100                 105                 110

Ser Leu Ser Ser Ala Pro Leu Tyr Arg Leu Leu Leu Ile Lys Thr Gly
        115                 120                 125

Asp Gln Gln His Glu Leu Val Ile Cys Thr His His Ile Val Cys Asp
    130                 135                 140

Gly Ile Ser Leu Gln Leu Leu Leu Gln Lys Ile Val Ser Ala Tyr Gln
145                 150                 155                 160

Gly Gln Ser Asp Gly Arg Val Leu Thr Ser Pro Asp Glu Glu Thr Leu
                165                 170                 175

Gln Phe Val Asp Tyr Ala Ala Trp Ser Arg Gln His Glu Tyr Ala Gly
            180                 185                 190

Leu Glu Tyr Trp Arg Gln Gln Leu Ala Asp Ala Pro Thr Ile Leu Asp
        195                 200                 205

Ile Ser Thr Lys Thr Gly Arg Ser Glu Gln Gln Thr Phe Leu Gly Ala
    210                 215                 220

Arg Ile Pro Val Glu Phe Ser His His Gln Trp Gln Ala Leu Arg Gln
225                 230                 235                 240

Ile Phe Arg Pro Gln Gly Ile Ser Cys Ala Ala Val Phe Leu Ala Ala
                245                 250                 255

Tyr Cys Val Val Leu His Arg Leu Ala Glu Gln Asp Asp Ile Leu Ile
            260                 265                 270

Gly Leu Pro Thr Ser Asn Arg Leu Arg Pro Glu Leu Ala Gln Val Ile
        275                 280                 285

Gly Tyr Leu Ser Asn Leu Cys Val Phe Arg Ser Gln Tyr Ala His Asp
    290                 295                 300

Gln Ser Val Thr Asp Phe Leu Gln Gln Val Gln Leu Thr Leu Pro Asn
305                 310                 315                 320

Leu Ile Glu His Gly Glu Thr Pro Phe Gln Gln Val Leu Glu Ser Val
                325                 330                 335

Glu His Thr Arg Gln Ala Gly Val Thr Pro Leu Cys Gln Val Leu Phe
            340                 345                 350
```

```
Gly Tyr Glu Gln Asp Val Arg Arg Thr Leu Asp Ile Gly Asp Leu Gln
        355                 360                 365

Leu Thr Val Ser Asp Val Asp Thr Gly Ala Ala Arg Leu Asp Leu Ser
    370                 375                 380

Leu Phe Leu Phe Glu Asp Glu Leu Asn Val Cys Gly Phe Leu Glu Tyr
385                 390                 395                 400

Ala Thr Asp Arg Ile Asp Ala Ala Ser Ala Gln Asn Met Val Arg Met
                405                 410                 415

Leu Ser Ser Val Leu Arg Glu Phe Val Ala Ala Pro Gln Ala Pro Leu
            420                 425                 430

Ser Glu Val Gln Leu Gly Ala Ala Asp Ser Gln Ala Gln Thr Pro Ala
        435                 440                 445

Ile Ala Pro Ala Phe Pro Ser Val Pro Ala Arg Leu Phe Ala Leu Ala
    450                 455                 460

Asp Ser His Pro Asn Ala Thr Ala Leu Arg Asp Glu Gln Gly Glu Leu
465                 470                 475                 480

Thr Tyr Ala Gln Val Cys Gln Gln Ile Leu Gln Ala Ala Ala Thr Leu
                485                 490                 495

Arg Ala Gln Gly Ala Lys Pro Gly Thr Leu Ile Ala Val Ile Gly Glu
            500                 505                 510

Arg Gly Asn Pro Trp Leu Ile Ala Met Leu Ala Ile Trp Gln Val Gly
        515                 520                 525

Gly Ile Tyr Val Pro Leu Ser Lys Asp Leu Pro Glu Gln Arg Leu Gln
    530                 535                 540

Gly Ile Leu Ala Glu Leu Glu Gly Ala Ile Leu Ile Thr Asp Asp Thr
545                 550                 555                 560

Thr Pro Glu Arg Phe Arg Gln Arg Val Thr Leu Pro Met His Ala Leu
                565                 570                 575

Trp Ala Asp Gly Ala Thr His His Glu Arg Gln Thr Thr Asp Ala Ser
            580                 585                 590

Arg Leu Ser Gly Tyr Met Met Tyr Thr Ser Gly Ser Thr Gly Lys Pro
        595                 600                 605

Lys Gly Val His Val Ser Gln Ala Asn Leu Val Ala Thr Leu Ser Ala
    610                 615                 620

Phe Gly Gln Leu Leu Gln Val Lys Pro Ser Asp Arg Met Leu Ala Leu
625                 630                 635                 640

Thr Thr Phe Ser Phe Asp Ile Ser Leu Leu Glu Leu Leu Leu Pro Leu
                645                 650                 655

Val Gln Gly Ala Ser Val Gln Ile Ala Val Ala Gln Ala Gln Arg Asp
            660                 665                 670

Ala Glu Lys Leu Ala Gly Tyr Leu Ala Asp Pro Arg Ile Thr Leu Val
        675                 680                 685
```

```
Gln Ala Thr Pro Val Thr Trp Arg Leu Leu Leu Ser Thr Gly Trp Gln
    690                 695                 700

Pro Arg Glu Ser Leu Thr Leu Leu Cys Gly Gly Glu Ala Leu Pro Gln
705                 710                 715                 720

Asp Leu Ala Asp Arg Leu Cys Leu Pro Gly Met Thr Leu Trp Asn Leu
                725                 730                 735

Tyr Gly Pro Thr Glu Thr Thr Ile Trp Ser Thr Ala Cys Arg Leu Gln
            740                 745                 750

Pro Gly Ala Pro Val Gln Leu Gly His Pro Ile Ala Gly Thr Gln Ile
        755                 760                 765

Ala Leu Val Asp Arg Asn Leu Arg Ser Val Pro Arg Gly Val Ile Gly
    770                 775                 780

Glu Leu Leu Ile Cys Gly Pro Gly Val Ser Gln Gly Tyr Tyr Arg Asn
785                 790                 795                 800

Pro Val Glu Thr Ala Lys Arg Phe Val Pro Asp Pro His Gly Ser Gly
                805                 810                 815

Lys Arg Ala Tyr Leu Thr Gly Asp Arg Met Arg Met Gln Gln Asp Gly
            820                 825                 830

Ser Leu Ala Tyr Ile Gly Arg Arg Asp Asp Gln Ile Lys Leu Arg Gly
        835                 840                 845

His Arg Ile Glu Leu Gly Glu Ile Glu Thr Ala Leu Arg Lys Leu Pro
    850                 855                 860

Gly Val Arg Asp Ala Ala Ala Gln Leu His Asp Gln Asp Pro Ser Arg
865                 870                 875                 880

Gly Ile Gln Ala Phe Val Gln Leu Cys Ala Thr Val Asp Glu Ser Leu
                885                 890                 895

Ile Asp Ile Gly Gln Trp Leu Glu Thr Leu Arg Gln Thr Leu Pro Glu
            900                 905                 910

Ala Trp Leu Pro Thr Glu Tyr Tyr Arg Ile Asp Gly Ile Pro Leu Thr
        915                 920                 925

Tyr Asn Gly Lys Arg Asp Arg Lys Arg Leu Leu His Gln Ala Val Arg
    930                 935                 940

Leu Gln Thr Leu Ser Leu Arg Val Ala Pro Ser Ser Asp Thr Glu Thr
945                 950                 955                 960

Arg Val Gln Gln Ile Trp Cys Glu Leu Leu Gly Leu Glu Asp Ile Gly
                965                 970                 975

Val Thr Asp Asp Phe Phe Gln Leu Gly Gly His Ser Ile Leu Val Ala
            980                 985                 990

Arg Met Val Glu Arg Ile Glu Thr Ala Phe Gly Arg Arg Val Pro Ile
        995                1000                1005

Ala Asp Ile Tyr Phe Ser Pro Thr Ile Ala Arg Val Ala Ala Thr Leu
   1010                1015                1020
```

```
Asp Ser Met Thr Phe Glu Gln Gly Leu Ala Ala His Ser Val Lys Gly
1025                1030                1035                1040

Asp Trp Glu Phe Thr Ala Ile Ser Leu Gln His Asn Ala Asp Ser Thr
                    1045                1050                1055

Ala Ala Ala Gln Glu Arg
            1060


<210> 4
<211> 1432
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 4
Met His Ser Pro Thr Ile Asp Thr Phe Glu Ala Ala Leu Arg Ser Leu
  1                 5                  10                  15

Pro Ala Ala Arg Asp Ala Leu Gly Ala Tyr Pro Leu Ser Ser Glu Gln
             20                  25                  30

Lys Arg Leu Trp Leu Leu Ala Gln Leu Ala Gly Thr Ala Thr Leu Pro
         35                  40                  45

Val Thr Val Arg Tyr Ala Phe Thr Gly Thr Val Asp Leu Ala Val Val
     50                  55                  60

Gln Gln Asn Leu Ser Ala Trp Ile Ala His Ser Glu Ser Leu Arg Ser
 65                  70                  75                  80

Leu Phe Val Glu Val Leu Glu Arg Pro Val Arg Leu Leu Met Pro Thr
                 85                  90                  95

Gly Leu Val Lys Leu Glu Tyr Phe Asp Arg Pro Pro Ser Asp Ala Asp
            100                 105                 110

Met Ala Glu Leu Ile Gly Ala Ala Phe Glu Leu Asp Lys Gly Pro Leu
        115                 120                 125

Leu Arg Ala Phe Ile Thr Arg Thr Ala Ala Gln Gln His Glu Leu His
    130                 135                 140

Leu Val Gly His Pro Ile Val Val Asp Glu Pro Ser Leu Gln Arg Ile
145                 150                 155                 160

Ala Gln Thr Leu Phe Gln Thr Glu Pro Asp His Gln Tyr Pro Ala Val
                165                 170                 175

Gly Ala Ile Ala Glu Val Phe Gln Arg Glu Gln Thr Leu Ala Gln Asp
            180                 185                 190

Ala Gln Ile Thr Glu Gln Trp Gln Gln Trp Gly Ile Gly Leu Gln Ala
        195                 200                 205

Pro Ala Ala Thr Glu Ile Pro Thr Glu Asn Pro Arg Pro Ala Ile Lys
    210                 215                 220

Gly Ser Asp Arg Gln Val His Glu Ala Leu Thr Ala Trp Gly Asp Gln
225                 230                 235                 240

Pro Val Ala Glu Ala Glu Ile Val Ser Ser Trp Leu Thr Val Leu Met
                245                 250                 255
```

```
Arg Trp Gln Gly Ser Gln Ser Ala Leu Cys Ala Ile Lys Val Arg Asp
            260                 265                 270

Lys Ala His Ala Asn Leu Ile Gly Pro Leu Gln Thr Tyr Leu Pro Val
        275                 280                 285

Arg Val Asp Met Pro Asp Gly Ser Thr Leu Ala Gln Leu Arg Leu Gln
    290                 295                 300

Val Glu Glu Gln Leu Asn Gly Asn Asp His Pro Ser Phe Ser Thr Leu
305                 310                 315                 320

Leu Glu Val Cys Pro Pro Lys Arg Asp Leu Ser Arg Thr Pro Tyr Phe
                325                 330                 335

Gln Thr Gly Leu Gln Phe Ile Ala His Asp Val Glu Gln Arg Asp Phe
            340                 345                 350

His Ala Gly Asn Leu Thr Arg Leu Pro Thr Lys Gln Pro Ser Ser Asp
        355                 360                 365

Leu Asp Leu Phe Ile Ser Cys Trp Val Ser Asp Gly Thr Leu Gly Leu
    370                 375                 380

Thr Leu Asp Tyr Asp Cys Ala Val Leu Asn Ser Ser Gln Val Glu Val
385                 390                 395                 400

Leu Ala Gln Ala Leu Ile Ser Val Leu Ser Ala Pro Gly Glu Gln Pro
                405                 410                 415

Ile Ala Thr Val Ala Leu Met Gly Gln Gln Met Gln Gln Thr Val Leu
            420                 425                 430

Ala Gln Ala His Gly Pro Arg Thr Thr Pro Pro Gln Leu Thr Leu Thr
        435                 440                 445

Glu Trp Val Ala Ala Ser Thr Glu Lys Ser Pro Leu Ala Val Ala Val
    450                 455                 460

Ile Asp His Gly Gln Gln Leu Ser Tyr Ala Glu Leu Trp Ala Arg Ala
465                 470                 475                 480

Ala Leu Val Ala Ala Asn Ile Ser Gln His Val Ala Lys Pro Arg Ser
                485                 490                 495

Ile Ile Ala Val Ala Leu Pro Arg Ser Ala Glu Phe Ile Ala Ala Leu
            500                 505                 510

Leu Gly Val Val Arg Ala Gly His Ala Phe Leu Pro Ile Asp Pro Arg
        515                 520                 525

Leu Pro Thr Asp Arg Ile Gln Phe Leu Ile Glu Asn Ser Gly Cys Glu
    530                 535                 540

Leu Val Ile Thr Ser Asp Gln Gln Ser Val Glu Gly Trp Pro Gln Val
545                 550                 555                 560

Ala Arg Ile Arg Met Glu Ala Leu Asp Pro Asp Ile Arg Trp Val Ala
                565                 570                 575

Pro Thr Gly Leu Ser His Ser Asp Ala Ala Tyr Leu Ile Tyr Thr Ser
            580                 585                 590
```

```
Gly Ser Thr Gly Val Pro Lys Gly Val Val Val Glu His Arg Gln Val
        595                 600                 605

Val Asn Asn Ile Leu Trp Arg Gln Arg Thr Trp Pro Leu Thr Ala Gln
    610                 615                 620

Asp Asn Val Leu His Asn His Ser Phe Ser Phe Asp Pro Ser Val Trp
625                 630                 635                 640

Ala Leu Phe Trp Pro Leu Leu Thr Gly Gly Thr Ile Val Leu Ala Asp
                645                 650                 655

Val Arg Thr Met Glu Asp Ser Thr Ala Leu Leu Asp Leu Met Ile Arg
            660                 665                 670

His Asp Val Ser Val Leu Gly Gly Val Pro Ser Leu Leu Gly Thr Leu
        675                 680                 685

Ile Asp His Pro Phe Ala Asn Asp Cys Arg Ala Val Lys Leu Val Leu
    690                 695                 700

Ser Gly Gly Glu Val Leu Asn Pro Glu Leu Ala His Lys Ile Gln Lys
705                 710                 715                 720

Val Trp Gln Ala Asp Val Ala Asn Leu Tyr Gly Pro Thr Glu Ala Thr
                725                 730                 735

Ile Asp Ala Leu Tyr Phe Ser Ile Asp Lys Asn Ala Ala Gly Ala Ile
            740                 745                 750

Pro Ile Gly Tyr Pro Ile Asp Asn Thr Asp Ala Tyr Ile Val Asp Leu
        755                 760                 765

Asn Leu Asn Pro Val Pro Pro Gly Val Pro Gly Glu Ile Met Leu Ala
    770                 775                 780

Gly Gln Asn Leu Ala Arg Gly Tyr Leu Gly Lys Pro Ala Gln Thr Ala
785                 790                 795                 800

Gln Arg Phe Leu Pro Asn Pro Phe Gly Asn Gly Arg Val Tyr Ala Thr
                805                 810                 815

Gly Asp Leu Gly Arg Arg Trp Ser Ser Gly Ala Ile Ser Tyr Leu Gly
            820                 825                 830

Arg Arg Asp Gln Gln Val Lys Ile Arg Gly His Arg Ile Glu Leu Asn
        835                 840                 845

Glu Val Ala His Leu Leu Cys Gln Ala Leu Glu Leu Lys Glu Ala Ile
    850                 855                 860

Val Phe Ala Gln His Ala Gly Thr Glu Gln Ala Arg Leu Val Ala Ala
865                 870                 875                 880

Ile Glu Gln Gln Pro Gly Leu His Ser Glu Gly Ile Lys Gln Glu Leu
                885                 890                 895

Leu Arg His Leu Pro Ala Tyr Leu Ile Pro Ser Gln Leu Leu Leu Leu
            900                 905                 910

Asp Glu Leu Pro Arg Thr Ala Thr Gly Lys Val Asp Met Leu Lys Leu
        915                 920                 925
```

```
Asp Gln Leu Ala Ala Pro Gln Leu Asn Asp Ala Gly Gly Thr Glu Cys
     930                 935                 940

Arg Ala Pro Arg Thr Asp Leu Glu Gln Ser Val Met Thr Asp Phe Ala
945                 950                 955                 960

Gln Val Leu Gly Leu Thr Ala Val Thr Pro Asp Thr Asp Phe Phe Glu
                965                 970                 975

Gln Gly Gly Asn Ser Ile Leu Leu Thr Arg Leu Ala Gly Thr Leu Ser
            980                 985                 990

Ala Lys Tyr Gln Val Gln Ile Pro Leu His Glu Phe Phe Leu Thr Pro
        995                1000                1005

Thr Pro Ala Ala Val Ala Gln Ala Ile Glu Ile Tyr Arg Arg Glu Gly
   1010                1015                1020

Leu Thr Ala Leu Leu Ser Arg Gln His Ala Gln Thr Leu Glu Gln Asp
1025                1030                1035                1040

Ile Tyr Leu Glu Glu His Ile Arg Pro Asp Gly Leu Pro His Ala Asn
                1045                1050                1055

Trp Tyr Gln Pro Ser Val Val Phe Leu Thr Gly Ala Thr Gly Tyr Leu
            1060                1065                1070

Gly Leu Tyr Leu Ile Glu Gln Leu Leu Lys Arg Thr Thr Ser Arg Val
        1075                1080                1085

Ile Cys Leu Cys Arg Ala Lys Asp Ala Glu His Ala Lys Ala Arg Ile
   1090                1095                1100

Leu Glu Gly Leu Lys Thr Tyr Arg Ile Asp Val Gly Ser Glu Leu His
1105                1110                1115                1120

Arg Val Glu Tyr Leu Thr Gly Asp Leu Ala Leu Pro His Leu Gly Leu
                1125                1130                1135

Ser Glu His Gln Trp Gln Thr Leu Ala Glu Glu Val Asp Val Ile Tyr
            1140                1145                1150

His Asn Gly Ala Leu Val Asn Phe Val Tyr Pro Tyr Ser Ala Leu Lys
        1155                1160                1165

Ala Thr Asn Val Gly Gly Thr Gln Ala Ile Leu Glu Leu Ala Cys Thr
   1170                1175                1180

Ala Arg Leu Lys Ser Val Gln Tyr Val Ser Thr Val Asp Thr Leu Leu
1185                1190                1195                1200

Ala Thr His Val Pro Arg Pro Phe Ile Glu Asp Asp Ala Pro Leu Arg
                1205                1210                1215

Ser Ala Val Gly Val Pro Val Gly Tyr Thr Gly Ser Lys Trp Val Ala
            1220                1225                1230

Glu Gly Val Ala Asn Leu Gly Leu Arg Arg Gly Ile Pro Val Ser Ile
        1235                1240                1245

Phe Arg Pro Gly Leu Ile Leu Gly His Thr Glu Thr Gly Ala Ser Gln
   1250                1255                1260
```

```
Ser Ile Asp Tyr Leu Leu Val Ala Leu Arg Gly Phe Leu Pro Met Gly
1265                1270                1275                1280

Ile Val Pro Asp Tyr Pro Arg Ile Phe Asp Ile Val Pro Val Asp Tyr
                1285                1290                1295

Val Ala Ala Ala Ile Val His Ile Ser Met Gln Pro Gln Gly Arg Asp
            1300                1305                1310

Lys Phe Phe His Leu Phe Asn Pro Ala Pro Val Thr Ile Arg Gln Phe
        1315                1320                1325

Cys Asp Trp Ile Arg Glu Phe Gly Tyr Glu Phe Lys Leu Val Asp Phe
    1330                1335                1340

Glu His Gly Arg Gln Gln Ala Leu Ser Val Pro Pro Gly His Leu Leu
1345                1350                1355                1360

Tyr Pro Leu Val Pro Leu Ile Arg Asp Ala Asp Pro Leu Pro His Arg
                1365                1370                1375

Ala Leu Asp Pro Asp Tyr Ile His Glu Val Asn Pro Ala Leu Glu Cys
            1380                1385                1390

Lys Gln Thr Leu Glu Leu Leu Ala Ser Ser Asp Ile Thr Leu Ser Lys
        1395                1400                1405

Thr Thr Lys Ala Tyr Ala His Thr Ile Leu Arg Tyr Leu Ile Asp Thr
    1410                1415                1420

Gly Phe Met Ala Lys Pro Gly Val
1425                1430


<210> 5
<211> 350
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 5
Met Glu Ser Ile Ala Phe Pro Ile Ala His Lys Pro Phe Ile Leu Gly
  1               5                  10                  15

Cys Pro Glu Asn Leu Pro Ala Thr Glu Arg Ala Leu Ala Pro Ser Ala
            20                  25                  30

Ala Met Ala Arg Gln Val Leu Glu Tyr Leu Glu Ala Cys Pro Gln Ala
        35                  40                  45

Lys Asn Leu Glu Gln Tyr Leu Gly Thr Leu Arg Glu Val Leu Ala His
    50                  55                  60

Leu Pro Cys Ala Ser Thr Gly Leu Met Thr Asp Asp Pro Arg Glu Asn
65                  70                  75                  80

Gln Glu Asn Arg Asp Asn Asp Phe Ala Phe Gly Ile Glu Arg His Gln
                85                  90                  95

Gly Asp Thr Val Thr Leu Met Val Lys Ala Thr Leu Asp Ala Ala Ile
            100                 105                 110

Gln Thr Gly Glu Leu Val Gln Arg Ser Gly Thr Ser Leu Asp His Ser
```

```
        115                 120                 125

Glu Trp Ser Asp Met Met Ser Val Ala Gln Val Ile Leu Gln Thr Ile
    130                 135                 140

Ala Asp Pro Arg Val Met Pro Glu Ser Arg Leu Thr Phe Gln Ala Pro
145                 150                 155                 160

Lys Ser Lys Val Glu Glu Asp Asp Gln Asp Pro Leu Arg Arg Trp Val
                165                 170                 175

Arg Gly His Leu Leu Phe Met Val Leu Cys Gln Gly Met Ser Leu Cys
            180                 185                 190

Thr Asn Leu Leu Ile Ser Ala Ala His Asp Lys Asp Leu Glu Leu Ala
        195                 200                 205

Cys Ala Gln Ala Asn Arg Leu Ile Gln Leu Met Asn Ile Ser Arg Ile
    210                 215                 220

Thr Leu Glu Phe Ala Thr Asp Leu Asn Ser Gln Gln Tyr Val Ser Gln
225                 230                 235                 240

Ile Arg Pro Thr Leu Met Pro Ala Ile Ala Pro Pro Lys Met Ser Gly
                245                 250                 255

Ile Asn Trp Arg Asp His Val Val Met Ile Arg Trp Met Arg Gln Ser
            260                 265                 270

Thr Asp Ala Trp Asn Phe Ile Glu Gln Ala Tyr Pro Gln Leu Ala Glu
        275                 280                 285

Arg Met Arg Thr Thr Leu Ala Gln Val Tyr Ser Ala His Arg Gly Val
    290                 295                 300

Cys Glu Lys Phe Val Gly Glu Glu Asn Thr Ser Leu Leu Ala Lys Glu
305                 310                 315                 320

Asn Ala Thr Asn Thr Ala Gly Gln Val Leu Glu Asn Leu Lys Lys Ser
                325                 330                 335

Arg Leu Lys Tyr Leu Lys Thr Lys Gly Cys Ala Gly Ala Gly
            340                 345                 350


<210> 6
<211> 61
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 6
Met Pro Thr Phe Leu Gly Asp Asp Asp Ala Val Pro Cys Val Val Val
  1               5                  10                  15

Val Asn Ala Asp Lys His Tyr Ser Ile Trp Pro Ser Ala Arg Asp Ile
            20                  25                  30

Pro Ser Gly Trp Ser Glu Glu Gly Phe Lys Gly Ser Arg Ser Asp Cys
        35                  40                  45

Leu Glu His Ile Ala Gln Ile Trp Pro Glu Pro Thr Ala
    50                  55                  60
```

<210> 7
<211> 355
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 7
Met Thr Ser Thr His Arg Thr Thr Asp Gln Val Lys Pro Ala Val Leu
  1   5   10   15

Asp Met Pro Gly Leu Ser Gly Ile Leu Phe Gly His Ala Ala Phe Gln
            20   25   30

Tyr Leu Arg Ala Ser Cys Glu Leu Asp Leu Phe Glu His Val Arg Asp
        35   40   45

Leu Arg Glu Ala Thr Lys Glu Ser Ile Ser Ser Arg Leu Lys Leu Gln
    50   55   60

Glu Arg Ala Ala Asp Ile Leu Leu Leu Gly Ala Thr Ser Leu Gly Met
65   70   75   80

Leu Val Lys Glu Asn Gly Ile Tyr Arg Asn Ala Asp Val Val Glu Asp
                85   90   95

Leu Met Ala Thr Asp Asp Trp Gln Arg Phe Lys Asp Thr Val Ala Phe
            100   105   110

Glu Asn Tyr Ile Val Tyr Glu Gly Gln Leu Asp Phe Thr Glu Ser Leu
        115   120   125

Gln Lys Asn Thr Asn Val Gly Leu Gln Arg Phe Pro Gly Glu Gly Arg
    130   135   140

Asp Leu Tyr His Arg Leu His Gln Asn Pro Lys Leu Glu Asn Val Phe
145   150   155   160

Tyr Arg Tyr Met Arg Ser Trp Ser Glu Leu Ala Asn Gln Asp Leu Val
                165   170   175

Lys His Leu Asp Leu Ser Arg Val Lys Lys Leu Leu Asp Ala Gly Gly
            180   185   190

Gly Asp Ala Val Asn Ala Ile Ala Leu Ala Lys His Asn Glu Gln Leu
        195   200   205

Asn Val Thr Val Leu Asp Ile Asp Asn Ser Ile Pro Val Thr Gln Gly
    210   215   220

Lys Ile Asn Asp Ser Gly Leu Ser His Arg Val Lys Ala Gln Ala Leu
225   230   235   240

Asp Ile Leu His Gln Ser Phe Pro Glu Gly Tyr Asp Cys Ile Leu Phe
                245   250   255

Ala His Gln Leu Val Ile Trp Thr Leu Glu Glu Asn Thr His Met Leu
            260   265   270

Arg Lys Ala Tyr Asp Ala Leu Pro Glu Gly Gly Arg Val Val Ile Phe
        275   280   285

Asn Ser Met Ser Asn Asp Glu Gly Asp Gly Pro Val Met Ala Ala Leu
    290   295   300

```
Asp Ser Val Tyr Phe Ala Cys Leu Pro Ala Glu Gly Gly Met Ile Tyr
305                 310                 315                 320

Ser Trp Lys Gln Tyr Glu Val Cys Leu Ala Glu Ala Gly Phe Lys Asn
                325                 330                 335

Pro Val Arg Thr Ala Ile Pro Gly Trp Thr Pro His Gly Ile Ile Val
            340                 345                 350

Ala Tyr Lys
        355


<210> 8
<211> 347
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 8
Met Ala Arg Ser Pro Glu Thr Asn Ser Ala Met Pro Gln Gln Ile Arg
  1               5                  10                  15

Gln Leu Leu Tyr Ser Gln Leu Ile Ser Gln Ser Ile Gln Thr Phe Cys
            20                  25                  30

Glu Leu Arg Leu Pro Asp Val Leu Gln Ala Ala Gly Gln Pro Thr Ser
        35                  40                  45

Ile Glu Arg Leu Ala Glu Gln Thr His Thr His Ile Ser Ala Leu Ser
    50                  55                  60

Arg Leu Leu Leu Lys Ala Leu Lys Pro Phe Gly Leu Val Lys Glu Thr Asp
65                  70                  75                  80

Glu Gly Phe Ser Leu Thr Asp Leu Gly Ala Ser Leu Thr His Asp Ala
                85                  90                  95

Phe Ala Ser Ala Gln Pro Ser Ala Leu Leu Ile Asn Gly Glu Met Gly
            100                 105                 110

Gln Ala Trp Arg Gly Met Ala Gln Thr Ile Arg Thr Gly Glu Ser Ser
        115                 120                 125

Phe Lys Met Tyr Tyr Gly Ile Ser Leu Phe Glu Tyr Phe Glu Gln His
    130                 135                 140

Pro Glu Arg Arg Ala Ile Phe Asp Arg Ser Gln Asp Met Gly Leu Asp
145                 150                 155                 160

Leu Glu Ile Pro Glu Ile Leu Glu Asn Ile Asn Leu Asn Asp Gly Glu
                165                 170                 175

Asn Ile Val Asp Val Gly Gly Gly Ser Gly His Leu Leu Met His Met
            180                 185                 190

Leu Asp Lys Trp Pro Glu Ser Thr Gly Ile Leu Phe Asp Leu Pro Val
        195                 200                 205

Ala Ala Lys Ile Ala Gln Gln His Leu His Lys Ser Gly Lys Ala Gly
    210                 215                 220

Cys Phe Glu Ile Val Ala Gly Asp Phe Phe Lys Ser Leu Pro Asp Ser
```

225 230 235 240

Gly Ser Val Tyr Leu Leu Ser His Val Leu His Asp Trp Gly Asp Glu
245 250 255

Asp Cys Lys Ala Ile Leu Ala Thr Cys Arg Arg Ser Met Pro Asp Asn
260 265 270

Ala Leu Leu Val Val Val Asp Leu Val Ile Asp Gln Ser Glu Ser Ala
275 280 285

Gln Pro Asn Pro Thr Gly Ala Met Met Asp Leu Tyr Met Leu Ser Leu
290 295 300

Phe Gly Ile Ala Gly Gly Lys Glu Arg Asn Glu Asp Glu Phe Arg Thr
305 310 315 320

Leu Ile Glu Asn Ser Gly Phe Asn Val Lys Gln Val Lys Arg Leu Pro
325 330 335

Ser Gly Asn Gly Ile Ile Phe Ala Tyr Pro Lys
340 345

<210> 9
<211> 180
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 9
Met Ser Thr Leu Val Tyr Tyr Val Ala Ala Thr Leu Asp Gly Tyr Ile
1 5 10 15

Ala Thr Gln Gln His Lys Leu Asp Trp Leu Glu Asn Phe Ala Leu Gly
20 25 30

Asp Asp Ala Thr Ala Tyr Asp Asp Phe Tyr Gln Thr Ile Gly Ala Val
35 40 45

Val Met Gly Ser Gln Thr Tyr Glu Trp Ile Met Ser Asn Ala Pro Asp
50 55 60

Asp Trp Pro Tyr Gln Asp Val Pro Ala Phe Val Met Ser Asn Arg Asp
65 70 75 80

Leu Ser Ala Pro Ala Asn Leu Asp Ile Thr Phe Leu Arg Gly Asp Ala
85 90 95

Ser Ala Ile Ala Val Arg Ala Arg Gln Ala Ala Lys Gly Lys Asn Val
100 105 110

Trp Leu Val Gly Gly Gly Lys Thr Ala Ala Cys Phe Ala Asn Ala Gly
115 120 125

Glu Leu Gln Gln Leu Phe Ile Thr Thr Ile Pro Thr Phe Ile Gly Thr
130 135 140

Gly Val Pro Val Leu Pro Val Asp Arg Ala Leu Glu Val Val Leu Arg
145 150 155 160

Glu Gln Arg Thr Leu Gln Ser Gly Ala Met Glu Cys Ile Leu Asp Val
165 170 175

Lys Lys Ala Asp
180

<210> 10
<211> 220
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 10
Met Ser Asn Val Phe Ser Gly Gly Lys Gly Asn Gly Asn Pro Gly Phe
1 5 10 15

Val Arg Thr Phe Ser Arg Ile Ala Pro Thr Tyr Glu Glu Lys Tyr Gly
20 25 30

Thr Lys Leu Ser Gln Ala His Asp Asp Cys Leu Arg Met Leu Ser Arg
35 40 45

Trp Met Cys Thr Ser Arg Pro Glu Arg Val Leu Asp Ile Gly Cys Gly
50 55 60

Thr Gly Ala Leu Ile Glu Arg Met Phe Ala Leu Trp Pro Glu Ala Arg
65 70 75 80

Phe Glu Gly Val Asp Pro Ala Gln Gly Met Val Asp Glu Ala Ala Lys
85 90 95

Arg Arg Pro Phe Ala Ser Phe Val Lys Gly Val Ala Glu Ala Leu Pro
100 105 110

Phe Pro Ser Gln Ser Met Asp Leu Val Val Cys Ser Met Ser Phe Gly
115 120 125

His Trp Ala Asp Lys Ser Val Ser Leu Asn Glu Val Arg Arg Val Leu
130 135 140

Lys Pro Gln Gly Leu Phe Cys Leu Val Glu Asn Leu Pro Ala Gly Trp
145 150 155 160

Gly Leu Thr Thr Leu Ile Asn Trp Leu Leu Gly Ser Leu Ala Asp Tyr
165 170 175

Arg Ser Glu His Glu Val Ile Gln Leu Ala Gln Thr Ala Gly Leu Gln
180 185 190

Ser Met Glu Thr Ser Val Thr Asp Gln His Val Ile Val Ala Thr Phe
195 200 205

Arg Pro Cys Cys Gly Glu Val Gly Asp His Gly Arg
210 215 220

<210> 11
<211> 509
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 11
Met Val Val Lys Asn Lys Gln Val Leu Val Val Gly Ala Gly Pro Val
1 5 10 15

Gly Leu Ala Val Ala Ala Ala Leu Ala Glu Leu Gly Ile Ala Val Asp

```
                20                  25                  30

Leu Ile Asp Lys Arg Pro Ala Ala Ser Pro His Ser Arg Ala Phe Gly
        35                  40                  45

Leu Glu Pro Val Thr Leu Glu Leu Leu Asn Ala Trp Gly Val Ala Asp
    50                  55                  60

Glu Met Ile Arg Arg Gly Ile Val Trp Ala Ser Ala Pro Leu Gly Asp
65                  70                  75                  80

Lys Ala Gly Arg Thr Leu Ser Phe Ser Lys Leu Pro Cys Glu Tyr Pro
                85                  90                  95

His Met Val Ile Ile Pro Gln Ser Gln Thr Glu Ser Val Leu Thr Asp
            100                 105                 110

Trp Val Asn Arg Lys Gly Val Asn Leu Lys Arg Gly Tyr Ala Leu Lys
        115                 120                 125

Ala Leu Asp Ala Gly Asp Leu His Val Glu Val Thr Leu Glu His Ser
    130                 135                 140

Glu Thr Gly Ser Val Gln Gln Ser Arg Tyr Asp Trp Val Leu Gly Ala
145                 150                 155                 160

Asp Gly Val Asn Ser Ser Val Arg Gln Leu Leu Asn Ile Ser Phe Val
                165                 170                 175

Gly Gln Asp Tyr Lys His Ser Leu Val Val Ala Asp Val Val Leu Arg
            180                 185                 190

Asn Pro Pro Ser Pro Ala Val His Ala Arg Ser Val Ser Arg Gly Leu
        195                 200                 205

Val Ala Leu Phe Pro Leu Pro Asp Gly Ser Tyr Arg Val Ser Ile Glu
    210                 215                 220

Asp Asn Glu Arg Met Asp Thr Pro Val Lys Gln Pro Val Thr His Glu
225                 230                 235                 240

Glu Ile Ala Gly Gly Met Lys Asp Ile Leu Gly Thr Asp Phe Gly Leu
                245                 250                 255

Ala Gln Val Leu Trp Ser Ala Arg Tyr Arg Ser Gln Gln Arg Leu Ala
            260                 265                 270

Thr His Tyr Arg Gln Gly Arg Val Phe Leu Leu Gly Asp Ala Ala His
        275                 280                 285

Thr His Val Pro Ala Gly Gly Gln Gly Leu Gln Met Gly Ile Gly Asp
    290                 295                 300

Ala Ala Asn Leu Ala Trp Lys Leu Ala Gly Val Ile Gln Ala Thr Leu
305                 310                 315                 320

Pro Met Asp Leu Leu Glu Ser Tyr Glu Ala Glu Arg Arg Pro Ile Ala
                325                 330                 335

Ala Ala Ala Leu Arg Asn Thr Asp Leu Leu Phe Arg Phe Asn Thr Ala
            340                 345                 350

Ser Gly Pro Ile Gly Arg Leu Ile His Trp Ile Gly Leu Gln Ala Thr
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        355                 360                 365

Arg Ala Pro Tyr Val Ala Gln Lys Val Val Ser Ala Leu Ala Gly Glu
    370                 375                 380

Gly Val Arg Tyr Asp Ser Val Arg Arg Arg Gly Asp His Arg Leu Val
385                 390                 395                 400

Gly Arg Arg Leu Pro Leu Leu Ser Leu Leu Pro Glu Gly Glu Arg Leu
                405                 410                 415

Pro Arg Gln Ser Leu Thr Gln Leu Leu Arg Ala Gly Arg Phe Val Leu
            420                 425                 430

Val His His Arg Ala Lys Ala Leu Ala Ala Asp Leu Arg Arg Asp Phe
        435                 440                 445

Pro Gly Leu Gln Thr Ala Ser Ile Cys Glu Asp Ser His Asn Asn Ser
    450                 455                 460

Leu Ser Ala Gly Glu Gly Val Ile Val Arg Pro Asp Gly Val Val Ile
465                 470                 475                 480

Trp Val Gly Lys Lys Ser Thr Leu Ala Lys Glu Arg Leu Gly Glu Trp
                485                 490                 495

Leu Leu Asp Asp Ser Lys Ser Ala Arg Gln Ser Leu Thr
            500                 505


<210> 12
<211> 348
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 12
Met Ala His Tyr Asp Ser Val Gly Thr Ala Pro Gly Ala Ser Asp Asp
  1               5                  10                  15

Gly Met Ala Val Ala Ser Ile Leu Gln Leu Met Arg Glu Thr Ile Thr
             20                  25                  30

Arg Ser Asp Ala Lys Asn Asn Val Val Phe Leu Leu Ala Asp Gly Glu
         35                  40                  45

Glu Leu Gly Leu Leu Gly Ala Glu His Tyr Val Ser Gln Leu Ser Thr
     50                  55                  60

Pro Glu Arg Glu Ala Ile Arg Leu Val Leu Asn Phe Glu Ala Arg Gly
 65                  70                  75                  80

Asn Gln Gly Ile Pro Leu Leu Phe Glu Thr Ser Gln Lys Asp Tyr Ala
                 85                  90                  95

Leu Ile Arg Thr Val Asn Ala Gly Val Arg Asp Ile Ile Ser Phe Ser
            100                 105                 110

Phe Thr Pro Leu Ile Tyr Asn Met Leu Gln Asn Asp Thr Asp Phe Thr
        115                 120                 125

Val Phe Arg Lys Lys Asn Ile Ala Gly Leu Asn Phe Ala Val Val Glu
    130                 135                 140
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```
Gly Phe Gln His Tyr His His Met Ser Asp Thr Val Glu Asn Leu Gly
145                 150                 155                 160

Pro Glu Thr Leu Phe Arg Tyr Gln Lys Thr Val Arg Glu Val Gly Asn
                165                 170                 175

His Phe Ile Gln Gly Ile Asp Leu Ser Ser Leu Ser Ala Asp Glu Asp
            180                 185                 190

Ala Thr Tyr Phe Pro Leu Pro Gly Gly Thr Leu Leu Val Leu Asn Leu
        195                 200                 205

Pro Thr Leu Tyr Ala Leu Gly Met Gly Ser Phe Val Leu Cys Gly Leu
    210                 215                 220

Trp Ala Gln Arg Cys Arg Thr Arg Arg Gln His Gln Gly Lys Asn Cys
225                 230                 235                 240

Val Leu Arg Pro Met Ala Ile Ala Leu Leu Gly Ile Ala Cys Ala Ala
                245                 250                 255

Leu Val Phe Tyr Val Pro Ser Ile Ala Tyr Leu Phe Val Ile Pro Ser
            260                 265                 270

Leu Leu Leu Ala Cys Ala Met Leu Ser Arg Ser Leu Phe Ile Ser Tyr
        275                 280                 285

Ser Ile Met Leu Leu Gly Ala Tyr Ala Cys Gly Ile Leu Tyr Ala Pro
    290                 295                 300

Ile Val Tyr Leu Ile Ser Ser Gly Leu Lys Met Pro Phe Ile Ala Gly
305                 310                 315                 320

Val Ile Ala Leu Leu Pro Leu Cys Leu Leu Ala Val Gly Leu Ala Gly
                325                 330                 335

Val Ile Ala Arg Ser Arg Asp Cys Arg Thr Cys Asp
            340                 345


<210> 13
<211> 572
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 13
Met Arg Ser Leu Lys Ile Ile Val Leu Ala Ser Ala Phe Asn Gly Leu
  1               5                  10                  15

Thr Gln Arg Ala Trp Leu Asp Leu Arg Gln Ser Gly His Ala Pro Ser
            20                  25                  30

Val Val Leu Phe Thr Asp Pro Ala Leu Val Cys Gln Gln Ile Glu Asp
        35                  40                  45

Ser Asp Ala Asp Leu Val Ile Cys Pro Phe Leu Lys Asp Arg Val Pro
    50                  55                  60

Gln Gln Leu Trp Ser Asn Leu Glu Arg Pro Val Val Ile Ile His Pro
65                  70                  75                  80

Gly Ile Val Gly Asp Arg Gly Ala Ser Ala Leu Asp Trp Ala Ile Ser
                85                  90                  95
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```
Gln Gln Val Gly Arg Trp Gly Val Thr Ala Leu Gln Ala Val Glu Glu
            100                 105                 110

Met Asp Ala Gly Pro Ile Trp Ser Thr Cys Glu Phe Asp Met Pro Ala
        115                 120                 125

Asp Val Arg Lys Ser Glu Leu Tyr Asn Gly Ala Val Ser Asp Ala Ala
    130                 135                 140

Leu Tyr Cys Ile Arg Asp Val Val Glu Lys Phe Ala Arg Val Phe Val
145                 150                 155                 160

Pro Val Pro Leu Asp Tyr Thr Gln Ala His Val Ile Gly Arg Leu Gln
                165                 170                 175

Pro Asn Met Thr Gln Ala Asp Arg Thr Phe Ser Trp Tyr Asp Cys Ala
            180                 185                 190


Arg Phe Ile Lys Arg Cys Ile Asp Ala Ala Asp Gly Gln Pro Gly Val
        195                 200                 205

Leu Ala Ser Ile Gln Gly Gly Gln Tyr Tyr Leu Tyr Asp Ala His Leu
    210                 215                 220

Asp Ala Arg His Gly Thr Pro Gly Glu Ile Leu Ala Val Gln Asp Asp
225                 230                 235                 240

Ala Val Leu Val Ala Ala Gly Asp Gln Ser Leu Trp Ile Gly Ser Leu
                245                 250                 255

Lys Arg Lys Ala Arg Pro Gly Glu Glu Thr Phe Lys Leu Pro Ala Arg
            260                 265                 270

His Val Leu Ala Glu Ala Leu Ala Asp Ile Pro Val Leu Asp Ser Ser
        275                 280                 285

Ile Ala Asn Gln Met Phe Asp Glu Gln Ala Tyr Gln Pro Ile Arg Tyr
    290                 295                 300

Arg Glu Ala Gly His Val Gly Glu Leu Thr Phe Glu Phe Tyr Asn Gly
305                 310                 315                 320

Ala Met Ser Thr Glu Gln Cys Gln Arg Leu Val Ala Ala Leu Arg Trp
                325                 330                 335

Ala Lys Thr Arg Asp Thr Gln Val Leu Val Ile Lys Gly Gly Arg Gly
            340                 345                 350

Ser Phe Ser Asn Gly Val His Leu Asn Val Ile Gln Ala Ala Pro Val
        355                 360                 365

Pro Gly Leu Glu Ala Trp Ala Asn Ile Gln Ala Ile Tyr Asp Val Cys
    370                 375                 380

His Glu Leu Leu Thr Ala Arg Gln Leu Val Ile Ser Gly Leu Thr Gly
385                 390                 395                 400

Ser Ala Gly Ala Gly Gly Val Met Leu Ala Leu Ala Ala Asp Ile Val
                405                 410                 415

Leu Ala Arg Glu Ser Val Val Leu Asn Pro His Tyr Lys Thr Met Gly
```

```
            420                 425                 430

Leu Tyr Gly Ser Glu Tyr Trp Thr Tyr Ser Leu Pro Arg Ala Val Gly
        435                 440                 445

Ser Glu Val Ala His Gln Leu Thr Asp Ala Cys Leu Pro Ile Ser Ala
    450                 455                 460

Leu Gln Ala Glu Gln Tyr Gly Leu Val Gln Gly Ile Gly Pro Arg Cys
465                 470                 475                 480

Pro His Ala Phe Ser Arg Trp Leu Met Gln Gln Ala Ser Ser Ala Leu
                485                 490                 495

Thr Asp Glu Lys Tyr Ala Val Ala Arg Ala Arg Lys Ala Ala Leu Asp
            500                 505                 510

Ile Asp Gln Ile Thr Arg Cys Arg Glu Ala Glu Leu Ala Gln Met Gln
        515                 520                 525

Leu Asp Met Val His Asn Arg His Gln Phe Ala Glu Lys Cys Arg Asn
    530                 535                 540

Phe Val Leu Lys Arg Lys Thr Cys Gln Thr Pro Gln Arg Leu Met Ala
545                 550                 555                 560

Pro Trp Ala Val Ala Arg Glu Ala Ala Leu Val Gly
                565                 570


<210> 14
<211> 230
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 14
Met Ile Gly Ile Val Ile Pro Ala His Asn Glu Glu Arg His Ile Ser
  1               5                  10                  15

Ala Cys Leu Ala Ser Ile Gln Arg Ala Ile Ala His Pro Ala Leu Ala
            20                  25                  30

His Gln Gln Val Gln Leu Leu Val Val Leu Asp Ala Cys Ser Asp Glu
        35                  40                  45

Thr Ala Thr Arg Val Ser Ala Met Gly Val Ala Thr Leu Glu Val Ser
    50                  55                  60

Val Arg Asn Val Gly Lys Ala Arg Ala Leu Gly Ala Glu Arg Leu Leu
65                  70                  75                  80

Glu Val Gly Ala Gln Trp Leu Ala Phe Thr Asp Ala Asp Thr Val Val
                85                  90                  95

Pro Ala Asp Trp Leu Val Arg Gln Ile Gly Phe Gly Ala Asp Ala Val
            100                 105                 110

Cys Gly Thr Val Glu Val Asp Ser Trp Ser Glu Tyr Gly Glu Ser Val
        115                 120                 125

Arg Ser Arg Tyr Leu Glu Leu Tyr Gln Phe Thr Glu Asn His Arg His
    130                 135                 140
```

```
Ile His Gly Ala Asn Leu Gly Leu Ser Ala Asp Ala Tyr Arg Asn Ala
145                 150                 155                 160

Gly Gly Phe Gln His Leu Val Ala His Glu Asp Val Gln Leu Val Ala
                165                 170                 175

Asp Leu Glu Arg Ile Gly Ala Arg Ile Val Trp Thr Ala Thr Asn Pro
            180                 185                 190

Val Val Thr Ser Ala Arg Arg Asp Tyr Lys Cys Arg Gly Gly Phe Gly
        195                 200                 205

Glu Tyr Leu Ala Ser Leu Val Ala Glu Gly Thr Arg Glu His Ser Pro
    210                 215                 220

Ala His Ala Pro Ile Gly
225                 230


<210> 15
<211> 348
<212> PRT
<213> Pseudomonas fluorescens A2-2

<400> 15
Met His Pro His Lys Thr Ala Ile Val Leu Ile Glu Tyr Gln Asn Asp
  1               5                  10                  15

Phe Thr Thr Pro Gly Gly Val Phe His Asp Ala Val Lys Asp Val Met
            20                  25                  30

Gln Thr Ser Asn Met Leu Ala Asn Thr Ala Thr Thr Ile Glu Gln Ala
        35                  40                  45

Arg Lys Leu Gly Val Lys Ile Ile His Leu Pro Ile Arg Phe Ala Asp
    50                  55                  60

Gly Tyr Pro Glu Leu Thr Leu Arg Ser Tyr Gly Ile Leu Lys Gly Val
65                  70                  75                  80

Ala Asp Gly Ser Ala Phe Arg Ala Gly Ser Trp Gly Ala Glu Ile Thr
                85                  90                  95

Asp Ala Leu Lys Arg Asp Pro Thr Asp Ile Val Ile Glu Gly Lys Arg
            100                 105                 110

Gly Leu Asp Ala Phe Ala Thr Thr Gly Leu Asp Leu Val Leu Arg Asn
        115                 120                 125

Asn Gly Ile Gln Asn Leu Val Val Ala Gly Phe Leu Thr Asn Cys Cys
    130                 135                 140

Val Glu Gly Thr Val Arg Ser Gly Tyr Glu Lys Gly Tyr Asp Val Val
145                 150                 155                 160

Thr Leu Thr Asp Cys Thr Ala Thr Phe Ser Asp Glu Gln Gln Arg Ala
                165                 170                 175

Ala Glu Gln Phe Thr Leu Pro Met Phe Phe Ala Asn Pro Ala Thr His
            180                 185                 190

Arg Val Ser Ala Ser Thr Glu Arg Arg Ile Lys Lys Ala Ala Thr Pro
        195                 200                 205
```

Ala Glu Ser Pro Leu Phe Cys Leu Gly His Ser Val Gly Ala Tyr Cys
    210   215   220

Ile Ser Pro Phe Pro Asn Asp Gln Ser Ser Arg Phe Thr Ser Thr Arg
225   230   235   240

Leu Ile His Thr Ser Ser Leu Arg Ser Pro Val Leu Ala Trp Met Pro
                245   250   255

Ser Ala Met Asn Leu Lys Ala Phe Phe Thr Ser Met Leu Arg Pro Ala
            260   265   270

Phe His Val Thr Trp Ile Asn Thr Ile Leu Gly Val Val Thr Pro Arg
        275   280   285

Tyr Pro Ala Ala Gly Thr Ser Ser Ser Leu Ala Trp Arg Leu Met Ile
    290   295   300

Trp Asn Leu Ser Cys Ser Gly Thr Leu Ala Thr Leu Val Ile Ala Ala
305   310   315   320

Tyr Thr Thr Ser Pro Met Ala Val Ala Val Ser Val Glu Val Ser Ala
                325   330   335

Ala Arg Ser Ile Arg Thr Lys Gly Met Asp Lys Ser
            340   345

<210> 16
<211> 5
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core
      peptide

<400> 16
Leu Lys Ala Gly Ala
  1   5

<210> 17
<211> 10
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core
      peptide

<220>
<221> MOD_RES
<222> (4)
<223> Ser or Thr

<220>
<221> MOD_RES
<222> (7)
<223> Variable amino acid

<400> 17

Ser Gly Thr Xaa Thr Gly Xaa Pro Lys Gly
1 5 10

<210> 18
<211> 9
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core peptide

<220>
<221> MOD_RES
<222> (5)
<223> Variable amino acid

<400> 18
Lys Ile Arg Gly Xaa Arg Ile Glu Leu
1 5

<210> 19
<211> 5
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core peptide

<220>
<221> MOD_RES
<222> (4)
<223> Variable amino acid

<400> 19
Leu Gly Gly Xaa Ser
1 5

<210> 20
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<220>
<221> modified_base
<222> (6)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (9)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base

<222> (12)
<223> a, c, t, g, unknown or other

<400> 20
tayggnccna cnga 14

<210> 21
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<220>
<221> modified_base
<222> (3)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (6)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (9)
<223> a, c, t, g, unknown or other

<220>
<221> modified_base
<222> (12)
<223> a, c, t, g, unknown or other

<400> 21
tsnccnccna dntcraaraa 20

<210> 22
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 22
cgtctagaca ccggcttcat gg 22

<210> 23
<211> 26
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 23
ggtctagata acagccaaca aacata 26

<210> 24
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 24
catctagacc ggactgatat tcg 23

<210> 25
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 25
ggtctagata acagccaaca aacata 26

<210> 26
<211> 6
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core peptide

<400> 26
Leu Lys Ala Gly Gly Ala
1 5

<210> 27
<211> 5
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core peptide

<400> 27
Ser Gly Thr Thr Gly
1 5

<210> 28
<211> 7
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core peptide

<400> 28
Gly Glu Leu Cys Ile Gly Gly
  1   5

<210> 29
<211> 8
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Illustrative core peptide

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Arg Ile Glu Leu Gly Glu Ile Glu
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<210> 30
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<213> Unknown Organism

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<223> Description of Unknown Organism: Illustrative core peptide

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<400> 31
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            20                  25                  30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        35                  40                  45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    50                  55                  60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
65                  70                  75                  80

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Thr Ser Gly Ser Thr
                85                  90                  95

Ala Asp Pro Lys Gly Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            100                 105                 110

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        115                 120                 125

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    130                 135                 140

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
145                 150                 155                 160

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                165                 170                 175

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            180                 185                 190

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        195                 200                 205

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    210                 215                 220

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
225                 230                 235                 240

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                245                 250                 255

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            260                 265                 270

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        275                 280                 285

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    290                 295                 300

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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305 310 315 320

Xaa Gly Glu Ile Trp Val Arg Gly Pro Ser Val Ala Gln Gly Tyr Xaa
325 330 335

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
340 345 350

Xaa Xaa Xaa Xaa Xaa Xaa Leu Arg Thr Gly Asp Leu Xaa Xaa Xaa Xaa
355 360 365

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
370 375 380

Xaa Xaa Xaa Asn Tyr Tyr Pro Gln Asp Leu Glu Leu Xaa Xaa Xaa Xaa
385 390 395 400

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
420 425 430

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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450 455 460

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
465 470 475 480

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
485 490 495

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
500 505 510

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
515 520 525

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
530 535 540

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu
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            20   25   30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        35   40   45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    50   55   60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Thr Ser Gly
65   70   75   80

Ser Thr Gly Gln Pro Lys Gly Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                85   90   95

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            100   105   110

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        115   120   125

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    130   135   140

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
145   150   155   160

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                165   170   175

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            180   185   190

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        195   200   205

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    210   215   220

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
225 230 235 240

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
245 250 255

Xaa Xaa Xaa Gly Glu Leu Phe Ile Gly Gly Ala Gly Val Ala Arg Gly
260 265 270

Tyr Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
275 280 285

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Arg Thr Gly Asp Leu Xaa
290 295 300

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
305 310 315 320

Xaa Xaa Xaa Xaa Xaa Xaa Phe Arg Ile Glu Phe Glu Glu Ile Glu Xaa
325 330 335

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
340 345 350

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
355 360 365

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
370 375 380

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
385 390 395 400

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
405 410 415

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
420 425 430

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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Leu Leu Ala Thr Arg Leu Ala Thr Arg Leu Ala
465 470 475

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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            20   25   30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        35   40   45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    50   55   60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Thr Ser Gly
65   70   75   80

Ser Ser Gly Arg Pro Lys Gly Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                85   90   95

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            100   105   110

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        115   120   125

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    130   135   140

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
145   150   155   160

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                165   170   175

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            180   185   190

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        195   200   205

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    210   215   220

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
225   230   235   240

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                245   250   255

Xaa Xaa Xaa Xaa Gly Glu Leu Phe Ile Gly Gly Ser Gly Val Ala Arg
            260   265   270

Gly Tyr Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        275   280   285

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Arg Thr Gly Asp Leu
    290   295   300

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
305   310   315   320

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Arg Ile Glu Leu Ala Glu Ile Glu
                325   330   335

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            340   345   350

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        355   360   365

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    370   375   380

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
385   390   395   400

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                405   410   415

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            420   425   430

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        435   440   445

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Phe Glu Leu Gly Gly Asn
    450   455   460

Ser Leu Leu Ala Gly Arg Leu Val Glu Glu Leu Asp
465   470   475

<210> 34
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<213> Myxococcus xanthus

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            20   25   30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        35   40   45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    50   55   60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr
65   70   75   80

Thr Ser Gly Ser Thr Gly Thr Pro Lys Ala Xaa Xaa Xaa Xaa Xaa Xaa
                85   90   95

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            100   105   110

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        115   120   125

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    130   135   140

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
145   150   155   160

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                165   170   175

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            180   185   190

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
        195   200   205

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
    210   215   220

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
225   230   235   240

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
                245   250   255

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly Glu Leu

260 265 270

Phe Val Gly Gly Val Gly Leu Ala Arg Gly Tyr Xaa Xaa Xaa Xaa Xaa
275 280 285

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
290 295 300

Xaa Xaa Xaa Tyr Arg Thr Gly Asp Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa
305 310 315 320

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
325 330 335

Tyr Arg Val Glu Leu Gly Glu Ile Glu Xaa Xaa Xaa Xaa Xaa Xaa Xaa
340 345 350

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
355 360 365

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
370 375 380

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
385 390 395 400

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405 410 415

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
420 425 430

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
435 440 445

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
450 455 460

Xaa Xaa Xaa Phe Phe Glu Val Gly Gly Thr Ser Leu Leu Leu Ala Arg
465 470 475 480

Leu Ala Ser Arg Leu Leu
485

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<223> Description of Unknown Organism: A5 core peptide

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